

CLAIMS

1. A process for producing 1,4-dihydroxy-2-naphthoic acid comprising initiating the culture of 1,4-dihydroxy-2-naphthoic acid producing bacteria belonging to propionic acid bacteria under anaerobic conditions and culturing the bacteria under aeration into the medium when the concentration of a carbon source in the medium is 3.5% by mass or less.
2. The process according to claim 1, wherein the medium comprises 4 to 8% by mass of the carbon source.
3. The process according to claim 1 or 2, wherein the anaerobic conditions are conditions under nitrogen gas or carbon dioxide gas atmosphere.
4. A process for producing 1,4-dihydroxy-2-naphthoic acid, comprising culturing 1,4-dihydroxy-2-naphthoic acid producing bacteria belonging to propionic acid bacteria under anaerobic conditions, adding a carbon source to the obtained culture and preserving the culture at 3 to 20°C under weak alkaline conditions.
5. The process according to claim 4, wherein the carbon source is added to the culture so that a concentration of the carbon source in the culture is 0.2 to 3% by mass.

6. The process according to claim 4 or 5, wherein the culture is preserved at pH 7 to 9 at 3 to 20°C for 1 to 3 weeks.

7. A process for producing 1,4-dihydroxy-2-naphthoic acid, comprising initiating the culture of 1,4-dihydroxy-2-naphthoic acid producing bacteria belonging to propionic acid bacteria under anaerobic conditions, culturing the bacteria under aeration into a medium when the concentration of a carbon source in the medium is 3.5% by mass or less, adding the carbon source to the obtained culture and preserving the culture at 3 to 20°C under weak alkaline conditions.

8. The process according to claim 7, wherein the medium comprises 4 to 8% by mass of the carbon source.

9. The process according to claim 7 or 8, wherein the anaerobic conditions are conditions under nitrogen gas or carbon dioxide gas atmosphere.

10. The process according to any one of claims 7 to 9, wherein the amount of carbon source added to the culture is such that a concentration of the carbon source in the culture is 0.2 to 3% by mass.

11. The process according to any one of claims 7 to 9, wherein the culture is preserved at pH 7 to 9 at 3 to 20°C for 1 to 3 weeks.

12. A composition comprising 1,4-dihydroxy-2-naphthoic acid obtained by the process according to any one of claims 1 to 11.

13. Food and beverages for improving abdominal discomfort, comprising the composition according to claim 12 as an active ingredient.

14. An agent for improving abdominal discomfort, comprising the composition according to claim 12 as an active ingredient.

15. Food and beverages for preventing and treating metabolic osteopathy, comprising the composition according to claim 12 as the active ingredient.

16. An agent for preventing and treating metabolic osteopathy, comprising the composition according to claim 12 as an active ingredient.

17. Use of the composition according to claim 12 for producing food and beverages for improving abdominal discomfort.

18. Use of the composition according to claim 12 for producing an agent for improving abdominal discomfort.

19. Use of the composition according to claim 12 for producing food and beverages for preventing and treating metabolic osteopathy.

20. Use of the composition according to claim 12 for producing an agent for preventing and treating metabolic osteopathy.

21. A method for treating abdominal discomfort, characterized by comprising administering an effective amount of the composition according to claim 12.

22. A method for treating metabolic osteopathy, characterized by comprising administering an effective amount of the composition according to claim 12.